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the Author.*

DISORDERS

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MISTAKEN FOR HYDROPHOBIA.

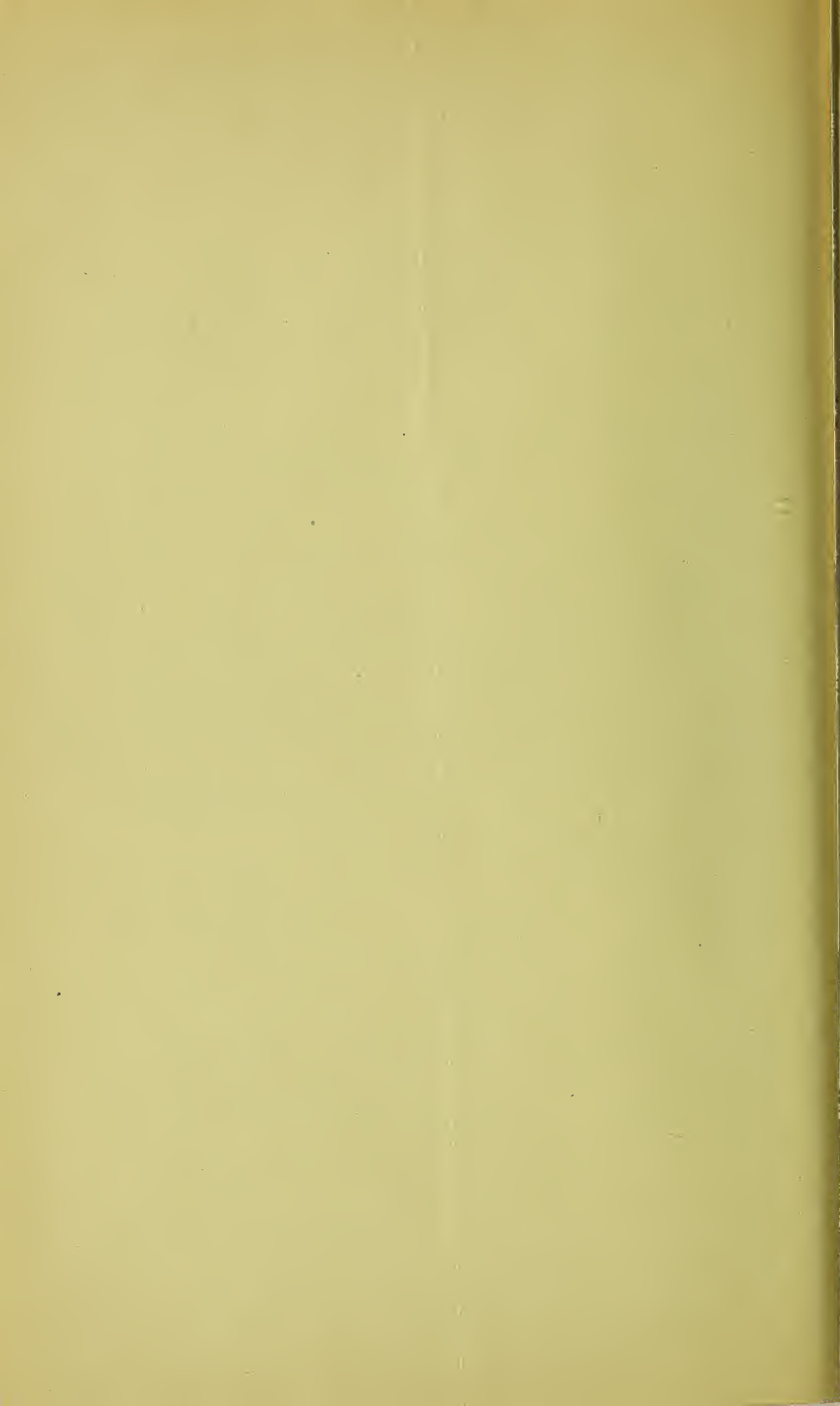
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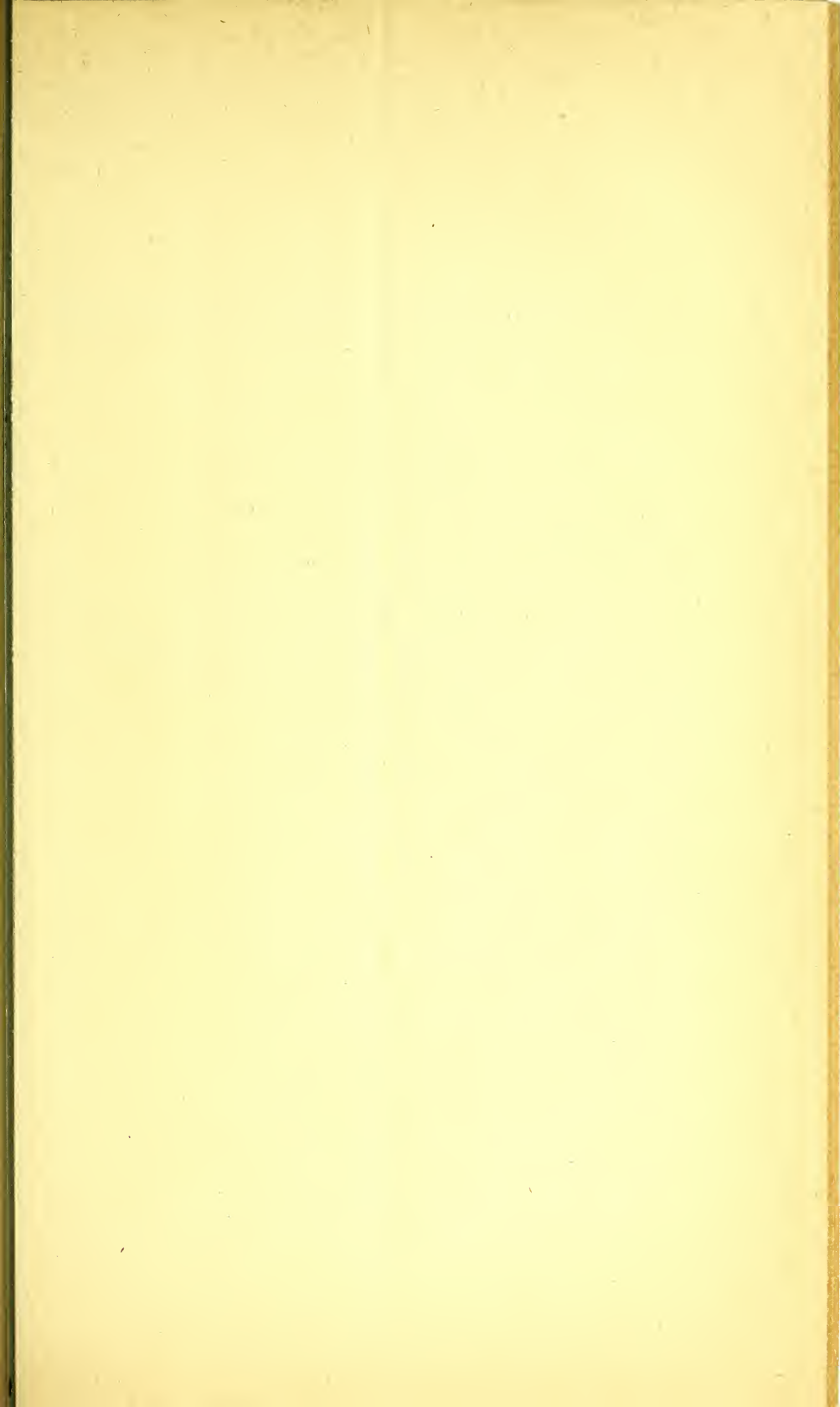
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DISORDERS MISTAKEN FOR HYDROPHOBIA.¹

IN all the round of medical science there is no subject so obscure as that of hydrophobia. There is also none in regard to which there is a larger and more daring range of speculation. The literature of the subject is enormous. It is made up of reports of cases almost innumerable, and of theories as to their nature, causes, and issue, which are as confusing to one who attempts to analyze them as might be the waves of a broad and troubled sea. For one to add anything to this already too extensive mass would seem a work worse than supererogatory, unless the addition could claim justification on the score of some seeming necessity. Fully aware of this, I come before you to-day to ask your attention to this old subject again, because, from a prolonged study of it and some experience, I am convinced that there is an aspect of the matter which has not as yet received the detailed attention which it deserves, which I think may be profitably studied, and on which I hope a summary of my own investigations may throw some light. I cannot expect such an imperfect sketch as I can here give of the panorama which has passed before my eyes in the last two years to produce just the same impression on your minds as it has fixed in mine; but I can, and do, hope to attract your notice to it, so that you may hereafter look at so much of it as shall come before you with the possibilities I shall point out in your view.

¹ In concluding the series of papers on hydrophobia of which this is one, I must acknowledge the advantage it has been to have access to the very rich Library of the College of Physicians of Philadelphia, in which, including the College library proper and that of Dr. Samuel Lewis, are contained the great majority of the works referred to in the Bibliography to be found at the end of this paper. In addition to these, I am indebted to the Library of the Surgeon-General U. S. A., at Washington, to the Library of the Pennsylvania Hospital, to the Ridgway Branch of the Philadelphia Library, to the private library of Prof. Alfred Stillé, and that of Prof. John Ashhurst, Jr., of this city.

From the brief abstract in the programme for this meeting you may gather the thought I wish to dwell upon to-day. It is that the knowledge in regard to the disorders in which the symptoms of hydrophobia may arise, and which may deceive not only the laity but also medical men, is much too general and vague. To this fact can be attributed, I believe, many mistakes which do little credit to our profession, and which have had most melancholy consequences upon the fellow-creatures to whom we minister. And if this state of affairs can be corrected, I believe it will not be in vain that we give some time to a study which may seem to have been already too much discussed.

Hydrophobia, as you well know, is almost invariably diagnosed from what medical men, as well as the laity, generally regard as its most constant and characteristic feature, namely, the inability or dread of the patient to swallow liquids. When to this is added a certain series of convulsive movements and psychical manifestations, the picture of hydrophobia is taken to be complete, and most men consider it justifiable to fix the diagnosis, with all that it implies both as to the past and as to the future of that particular case. So universal is this method of deciding upon the existence of hydrophobia, that one finds it suffices to throw almost all observers off their guard, and lead them to ignore the indications of other, less striking, but in many respects more important phenomena. As a consequence, while in innumerable instances the symptoms and lesions of a variety of other disorders have been attributed to hydrophobia, it is almost never suspected that the horror of drinking is but a symptom of another disease, which could not fail of being recognized, were it not for the undue importance attached to the aversion to fluids.

It is true that, in a general way, all physicians may be said to be quite aware that the symptoms of hydrophobia may present themselves in other disorders than that which is most unmistakably designated as "*rabies humana*." But the habit is to class all these suspicious cases under the vague title of "*spurious hydrophobia*," which adds a term to our nomenclature, but indicates no increase of knowledge. Who would suppose that such a term covered a variety of disorders which numbers not less than thirty, and probably many more? And yet such is the case. Some of these disorders are not very likely to be mistaken by any careful man; but some are calculated to deceive the most scrupulous observer, and every one of them has had some victims. This is not surprising when one considers the fact that the possibility of errors of this sort is not alluded to, in discussing the diseases in which these conditions may

arise, in a single work on general medicine, and that they receive entirely inadequate consideration even in treatises on hydrophobia. But a study of the records of the symptoms, and lesions discovered *post-mortem*, in a large number of cases of so-called hydrophobia supplies this lack, and furnishes material which may serve more purposes than as a warning against errors in diagnosis.

The diseases and morbid states to which I desire to call your attention I shall arrange as follows:—

- I. Disorders of the alimentary canal.
- II. Disorders of the respiratory apparatus.
- III. Disorders of the circulatory apparatus.
- IV. Systemic disorders.
- V. Disorders of the nervous system.

I. DISORDERS OF THE ALIMENTARY CANAL.

The first disorders to which I shall refer as furnishing symptoms which may be mistaken for those of hydrophobia, are *angina and cynanche of the fauces*. One can readily understand that an inflammation of the throat may cause such a difficulty of swallowing as to make this, especially before the ordinary signs of systemic disturbance have become very marked, the most striking symptom. When such a case occurs in an individual of a nervous temperament the very effort to overcome it might only increase the trouble; and if it should appear from the conduct of the medical attendant that a peculiar importance was attached to the successful performance of the act of deglutition, the distress of the patient and his inability to swallow would be likely to be all the more exaggerated. Under such circumstances the recollection of a dog-bite, in a person of years to appreciate the common belief in regard to hydrophobia, or the natural excitability and tendency to spasmodic resistance against any attempt to force him to a step which he knows or fancies to be disagreeable, on the part of a child, might be naturally expected to set up a train of physical and psychical phenomena which would closely resemble those of rabies. And no one, I think, who has studied the histories of many cases of so-called hydrophobia, and especially those which have occurred in very young children, can doubt that this very thing has happened over and over again. My own reading has brought to my notice many cases in which a want of appreciation of this fact has led to most pitiable errors of diagnosis and most fatal errors of treatment. In some of these the presence of an anginose disorder was suspected, but this idea abandoned upon the first manifestation of a dread of water. In others,

halting efforts at swallowing solids led to tests as to whether or not fluids could be swallowed, and when this appeared difficult or impossible the diagnosis was incontinently fixed as hydrophobia. I wish time permitted giving a number of illustrations of this; but I must content myself with a single one, selected from the writings of no ordinary observer, but from those of one who ranks high as a defender of the specific theory of hydrophobia and as a ridiculer of all disbelievers. I refer to Dr. Caleb Hillier Parry. In his monograph on "Cases of Tetanus and Rabies Contagiosa" (London, 1814), he gives the history of a case of a little boy, three-and-a-half years old, who had been subject to earache, with suppuration, and who had been bitten by a dog, of which there is not the slightest evidence that it was rabid. Fifty-two days after the bite he began to be ailing, then he complained of his ear and side of the head; he was hot, had a quick pulse, refused food and drink, was restless, and cried violently if any one attempted to touch his neck or head. He had the appearance of a patient in the commencement of scarlet fever. Attempts to look into his throat were fruitless, because of his struggles. He complained only of his ear, and held his hand to it. A solution of tartar emetic was repeatedly forced down his throat, and infusion of tobacco thrown into his rectum. He resisted all attempts to touch his neck or head, but expressed no uneasiness when pressed on any other part of his body. At one time an injection (presumably of tobacco infusion) produced sickness, retching, great convulsions, and an irregular, small, and quick pulse. He was at times wild and agitated, but swallowed his saliva without difficulty. His eyes were red and running with tears, and his pupils dilated. He passed very little urine, with a white sediment in it like chalk. On offering him a teaspoonful of water, his hands being held, he tried to avoid it by turning his face. At length his hands were confined, because he was always attempting to beat and tear his mouth and nose. He then had slaving, convulsions, and wandering, "though not insensibility" (Dr. Parry says); "as, while he attempted to strike those who held his hands, he avoided doing so to the lady, . . . who attended him with the most affectionate care." (How piteous the tale is!) "After this time he had frequent chokings, and his tongue remained much out of his mouth." Convulsions and stertorous breathing ushered in his death. Dr. Parry concludes his account with the remarkable statement that, at the autopsy, the most thorough examination of the various organs failed to disclose "any deviation whatever from the healthy state."

And was this truly a case of hydrophobia? Will any one take the opinion of Dr. Parry for such a diagnosis, in view of the history

he has given? Do you, gentlemen, see any other cause for this child's dysphagia—providing Dr. Parry overlooked nothing in reporting the absence of inflammatory lesions—than the angina dependent upon a serious disease of the middle or internal ear? And, let me ask, do you demand any other explanation of the poor child's death than the treatment he received? I confess, for myself, that I do not; and that I look upon this case as a striking illustration of the pernicious influence of the common belief in regard to hydrophobia; while the fact that such an illustration can be drawn from the experience of so able a man as Parry, only shows how dangerous is this error.

The dysphagia connected with *inflammation of the œsophagus* has also led to a false diagnosis of hydrophobia. An illustration of this error is furnished by a case recorded in detail by Mr. Robert White in his "Doubts of Hydrophobia" (London, 1826), and taken from a report by Dr. Pinckard, together with a report of the results of the autopsy. The patient was a man who fell ill with symptoms which I think were those of rheumatic fever—to which I shall refer again later—and who, after being treated in the most barbarous fashion, according to our modern ideas, died. At the autopsy there was found at the lower part of the œsophagus an eroded spot nearly the size of a shilling, assuming an appearance as if the inner coat had been separated and shrivelled up by scorching. There was also marked inflammation of the fauces. Mr. White, in repeating the history of this case, makes a comment which I think would be held to be justified by any one who reads it carefully, namely: "Nothing, it appears, could persuade the man that his illness proceeded from the bite of the dog; though, to do the medical men justice, they each used their utmost endeavors to make him believe so."

Inflammation of the stomach is so frequently associated with a dread of drinking that some writers, finding the lesions of it at the autopsies of patients who had been considered to have hydrophobia, have made the mistake of speaking as if it were an effect instead of a cause. It is as sure as anything can well be that inflammation of the stomach is not to be counted as an essential feature of hydrophobia, and it is equally clear that many cases which have been put on record as cases of hydrophobia were cases in which the dread of water was only incidental to the state of the stomach. It is easy to understand how a moderate degree of inflammation of this organ might not excite suspicion as to its causal relation to all the symptoms; but it is hard to see how extreme instances of disease of the stomach should have come to be as totally misunderstood as they

have been. When, for example, one finds such a case as is recorded by the learned Dr. Mead, in his "Mechanical Account of Poisons," where the inner coat of the stomach was so "*Mortified* that it might be abraded with one's Fingers," one may reasonably wonder that the reporter did not suspect that the lesion in the stomach could cause the symptoms, without calling in the influence of a bite of a dog only suspected to be mad. Another patient, mentioned by Mead, said the swallowing of his saliva put him "to such Tortures in his Stomach that Death itself was not so Terrible as the Inexpressible Agony." Here was a pain which ought to have led to suspicion; but it did not. Another case showed an erosion or excoriation, with something like a gangrene of the stomach. This from Dr. Mead; while Hufeland, in his "Enchiridion Medicum," sets down hydrophobia as a symptom of gastritis; and Dr. Rush, with many other writers, calls inflammation of the stomach a *cause* of hydrophobia.

Disorders of the intestines may also give rise to the symptoms of hydrophobia. This is a fact beyond dispute in regard to the lower animals, and perfectly demonstrable in regard to man. Bruchmüller, in a most valuable article in the Prager Vierteljahresschrift f. d. prakt. Heilkunde, II. Bd., 1852, shows conclusively that the symptoms of rabies are to be found in a variety of intestinal affections of the lower animals; and White cites Dr. Ainslie's work, "Observations on the Cholera Morbus of India," as stating that, in this disorder, "symptoms resembling those of hydrophobia have occasionally supervened," etc. Perhaps this statement may throw some light on an interesting case, often cited by the older authors, in which hydrophobia was said to have been caused by eating beech-nuts. It is also common to find in the older authors the statement that *intestinal worms* are a cause of this disorder. Among others, I would mention that Dr. Rush must have known of it in connection with *dysentery* and *typhus fever*, for he sets these also down as causes.

Before leaving the subject of the disorders of the alimentary canal, I wish to ask your attention to some statements of Dr. J. C. Prichard, in his "Treatise on Diseases of the Nervous System, Part the First, comprising Convulsive and Maniacal Affections" (London, 1822). In Chapter vii., sec. 2, he discusses what he calls enteric mania, and says: "This is one of the most frequent forms under which maniacal disorders present themselves to our notice." He then describes the usual condition of patients suffering in this way, in a manner which suggests the maniacal state of many cases of so-called hydrophobia, the histories of which I have read. The description of some of the symptoms and lesions is so strikingly like

that of a case of hydrophobia that I cannot refrain from quoting it. "The mouth and fauces," Dr. Prichard says, "if examined, generally present a diseased aspect. The fauces and velum pendulum are red, the vessels injected, covered in patches with mucus. The mouth is viscid, and the patient generally spits out a frothy slime in all directions. There is an ardent thirst. In many cases the patient has an aversion to all food. The skin is clammy and cold. The complexion is often flushed; the eyes wild, glassy, with a superabundant lachrymal secretion; the tunica conjunctiva is not unfrequently injected with blood; the patient is scarcely tolerant of light. The urine is scanty and high colored. The pulse is rapid and irritable."

Such are the very conditions which have been recorded of a large number of cases of so-called hydrophobia. And the similarity suggests more than a coincidence. In view of these facts, and of the attention which neuroses dependent upon disturbances of the intestinal canal are just now attracting, an interesting field for investigation is presented to students of nervous diseases.

II. DISORDERS OF THE RESPIRATORY APPARATUS.

To a certain extent the inflammations and anginas of the fauces to which a partial reference has already been made come within this category. Next in order come *inflammations of the larynx and trachea*. These may, like similar conditions of the fauces and œsophagus, give rise to all the dysphagic symptoms of hydrophobia. To this fact may be attributed not only a great many of the notions which have been entertained in regard to the lesions of hydrophobia, but also the old ideas and definition of the term "cynanche," which means literally "dog-choking." The frequency of this coincidence led Aromatarius, in 1625, to devote a monograph to proving that hydrophobia is nothing but a contagious angina; and the histories of many reported cases of so-called hydrophobia justify this opinion; for they have been clearly anginose, although by a strange process of inversion the striking inflammatory lesions which have been found in them *post mortem* have been looked upon as effects, when, in fact, they were really causes.

Vidal has given an illustration of the danger of mistaking a laryngitis for hydrophobia, which is striking enough to be repeated. He tells that in a large town where a man had recently died of rabies, another, suffering from intense angina, was brought into the hospital. The attending physician having his attention called to

the fact that the man refused to drink, the idea of hydrophobia at once entered his head. He urges the patient to drink. The latter says he cannot. Force is employed. The patient defends himself. The patient is bound. Convulsions ensue. He is cauterized beneath the tongue, and dies the next day. At the autopsy the true nature of the disease is revealed.¹

Turning now to the lungs, it is surprising how much evidence there is that *pneumonia and pleurisy* may be accompanied with so pronounced a dread of water as to lead to a diagnosis of hydrophobia. It is an extremely common thing to read of intense engorgement and symptoms of solidification of the lung, in the accounts of autopsies of supposed hydrophobic patients. One of Dr. Parry's cases presented at the autopsy emphysema under the pleura pulmonalis on both sides, and on one two ounces of bloody fluid in the pleural cavity. This case had also a patch of ecchymosis as large as a silver fourpence on the floor of the fourth ventricle.

So common are these appearances in the lungs that Dr. Nathaniel Chapman in his inaugural thesis, "An Essay on the Canine State of Fever" (Philadelphia, 1801)—which was the name he used to indicate hydrophobia—rests principally on them his argument that hydrophobia is, as his preceptor Dr. Benjamin Rush had asserted, a fever. He says (p. 51): "I have more than once hinted that this disease materially affects the lungs. It appears that by far the most common mode of attack is that of the varied forms of the pneumonic state of fever, and particularly pneumonia notha. From a review of the dissections which have been detailed, it evidently appears that the lungs are particularly affected. Indeed in many cases they have been so completely *engorged* as to have acquired considerable solidity. Admitting then the existence of this state, a solution is furnished to many of the phenomena of the disease, which have hitherto baffled every attempt to explain them." Again, he says (p. 53): "The aversion to fluids which has been considered as stamping a specific character upon this disease, and distinguishing it from all others, has not unfrequently occurred in pneumonia." A century before this, Mead had cited, in his "Mechanical Account of Poisons," a case in which the lungs were found "wonderfully *Red and Tumefied*;" and in his Medical Works (p. 510), there is an account of "Three Cases of the Hydrophobia," in one of which "the fauces were found very much inflamed; the

¹ Dolan, Thomas M., Rabies or Hydrophobia. 8vo, pp. viii, 287. London, 1879. P. 30.

left lobe of the lungs black, with the vesicles full of black blood; the surface in some places which the blackness had not covered, appearing blistered, as if raised by cantharides. The liver was hard, and of a yellow, bilious color."

III. DISORDERS OF THE CIRCULATORY APPARATUS.

That *inflammatory conditions of the heart and its coverings* may give rise to the symptoms of hydrophobia is a fact well recognized in most treatises and special articles on this subject. It is particularly referred to by Doléris, in his article on "Rage humaine" in the *Nouveau Dictionnaire de Méd. et de Chirurgie*, where he cites in this connection, a monograph of Bourceret, which I have not been able to obtain. But I have read the histories of many cases of so-called hydrophobia in which the evidences of pericarditis and endocarditis are unmistakable, and these lesions sufficient to account for all the symptoms. This fact is often all the more striking when taken in connection with the treatment employed. An interesting and most illustrative case of this sort (which I have once before referred to in public) has been recorded by Romberg in his work on Nervous Diseases, and repeated with approval by Dolan in his book on Rabies or Hydrophobia. This was the case of a child six years old, bitten by a dog which had already bitten several other children, none of whom (it is to be supposed) had hydrophobia. The attack came on three months later, and was fatal on the third day. The treatment consisted in taking twelve ounces of blood from the arm, scarifying, and applying cantharides to the cicatrix, and rubbing a scruple of mercurial ointment into the inner surface of the left arm. The record says the boy's features expressed extreme anxiety, and his eyes "told a tale of immeasurable misery." He implored that he might not be touched or bled again, as he desired nothing more than to be allowed perfect rest. But he was refused this piteous request, and the heroic treatment was continued until, as Romberg says, "death came to his relief." At the autopsy the lungs were found to be charged with blood. The larynx, the trachea, and œsophagus were not abnormal in appearance. But "the redness of the heart was remarkable, the arteries and veins on its surface looking as if they had been injected. The mitral and aortic valves presented a scarlet hue, the trabeculæ carneæ were darker than usual, the internal surface of the aorta was of a bright red hue as far as the arch; the blood contained in the vessels was dark and fluid; the inner surface of the stomach

was as pale as that of the œsophagus. No morbid change was found in any other abdominal organ." The head was not examined.

The full history of this case, taken together with the post-mortem appearances, seems to me to show it to have been one of acute endocarditis, probably septicæmic. But no such idea seems to have entered the heads of the physicians who attended it. As a case of hydrophobia they went most heroically to work to treat it. Think of that little child, only six years old, tested with the useless and dangerous tests of hand-washing and mirror, and with urine sprinkled on his skin—the former showing nothing, the latter causing a paroxysm. Think of his being bled, the cicatrix being scarified and blistered with cantharides, and mercurial ointment being rubbed into his arm. Then fancy him, when the doctors came at him after an interval, imploring only to be left in peace, while they, with grim determination, bled him again and dosed him with calomel, until "death came to his relief."

Before turning to another series of disorders in which hydrophobia is simulated, I wish to speak of the possibility of its being counterfeited in *cardiac neuroses*. A *palpitation* may bring about this condition. Dr. Mead had an experience of this sort; he says: "I remember a case in which fits of a palpitation of the heart were attended with so great a degree of it, that it seemed not to differ from the true hydrophobia." (*Medical Works*, p. 61.)

IV. SYSTEMIC DISORDERS.

I will now ask your attention to certain systemic disorders, and one natural condition, in which a dread of drinking and other symptoms like those of hydrophobia have been observed. The first of these is *rheumatic fever*. I have already alluded, when speaking of inflammation of the œsophagus, to a case where rheumatism was the conspicuous complaint at the outset of what was held to be a fatal case of hydrophobia. I recall it to your minds in connection with some remarks I wish to quote from the Lumleian Lecture of Dr. Todd in 1850, on Delirium and Coma. Speaking of rheumatic delirium, he says:—

"A patient with rheumatic fever will become restless, delirious, raving, maniacal, wakeful. As in the other acute forms of delirium, patients often die suddenly in this, evidently from exhaustion. . . . This delirium is sometimes ushered in by other symptoms, which denote a more extensive disturbance of the nervous system than delirium would do. Thus a patient will be seized with chorea-like jactitations affecting the upper extremities and the muscles of the

face; and sometimes a condition almost tetanic is present, and more or less of rigidity and opisthotonos are produced. Coincident with the first appearance of these symptoms, that is, either of the delirium or of the jactitations, we frequently find, but by no means always, the first signs of inflammation of the pericardium, or of the endocardium, or of one or both lungs, or of the pleura; and as the delirious state diverts the mind of the patient from the perception of all pain, it often happens that no other indications of the internal inflammation can be obtained than those of the physical signs, the rubbing sound or the bellows-murmur, or the altered breathing sounds; and hence it has not unfrequently happened that in the midst of the great disturbance of the intellect, the inflammation within the thorax has been unsuspected and undetected."

This description presents a remarkable counterpart to those contained in the reports of not a few cases of so called hydrophobia. And it seems to me to throw some light on a statement which has been repeated from author to author down to most recent times, that a sudden chilling of the body is one of the causes of "spontaneous hydrophobia." Further, it seems to furnish a reasonable explanation of many cases of hydrophobia, especially in little children, where no manifest lesion has been found after death, and where during life there was evidence of high inflammatory action, with great dread of being disturbed in any way.

This part of our subject is so important that I cannot leave it without another reference to the admirable work of Dr. Prichard on "Convulsive and Maniacal Affections," in which the similarity of the symptoms in many other disorders to those of hydrophobia can be traced, although the author seems to have had no such idea in his head. In regard to rheumatism and gout, he refers to cases where we only need a dread of drinking to be specifically mentioned to recognize them as typical of rabies. Even the post-mortem lesions correspond, and a most suggestive explanation is given of the want of proportion of the phenomena of inflammation to the severity of the symptoms and the outcome of the disease. (Chap. vi., sec. 3, of *Metastasis to the Head*.)

And now of *gout* let me briefly say that Dr. Todd, who seems as little as Dr. Prichard to have been thinking of hydrophobia when he wrote, remarks: "In cases of general gout, which resemble rheumatic fever in so many points, a delirium of precisely the same kind as that of rheumatic fever occurs, running the same course and presenting the same features in its clinical history." And this assertion is of the greater interest when we encounter such a statement as is made by White in his "Doubts of Hydrophobia," that

his friend Mr. H. Sutton had informed him of a case of translated gout, in which the symptom hydrophobia, exemplified by a dread of fluids generally, was unequivocally present.

Uræmia is another disorder in which hydrophobia may be simulated. To this fact is probably to be attributed the common belief that the presence of albumen in the urine is an evidence of hydrophobia. This curious process of inversion is observable in many recorded cases. One of the most striking of these which I have come across is reported by Bergeron, in an article "*De la Rage*," in the *Arch. Gén. de Méd.*, 1862. The patient was a child twelve and a half years old, first under the care of a quack, and afterward treated by the reporter with the assistance of a strait-jacket, and with hypodermic doses of *ten drops of a one per cent. solution of atropia* the first day, the next day a similar dose, and the third day *fifteen drops*. The fourth day the child died. At the autopsy there was found softening of the brain and medulla, the kidneys were congested and the urine contained "one-third albumen." Quite as striking as this story is the fact that the history of one of the cases from which Dr. Gowers obtained the specimens for his valuable investigations in regard to the pathological lesions of hydrophobia—which are too often cited as if they established a definite lesion for this disorder—discloses, with a total absence of evidence that the dog which bit the patient was mad, the fact that the patient's tongue was black and dry, his pulse 132, his temperature 100.1°, and at the autopsy his kidneys were found to be in a state of cloudy swelling. (*Trans. Path. Soc. London*, 1877.) The examination of such records—and I could cite many more, if time permitted—has seemed to me to show, not that albuminuria can be considered a symptom of hydrophobia, but that hydrophobia is occasionally a natural or a provoked symptom of nephritis. In this connection I must refer again to the Lumeleian Lecture of Dr. Todd, in which he describes a form of delirium, which he designates as "renal," and compares to that of epilepsy to be hereafter alluded to.

Besides these well-defined diseases there are many cases hard to classify exactly, in which a careful study of the records leads to the conclusion that what were regarded as manifestations of a specific disease derived from the inoculated virus of a rabid animal, were nothing but phenomena of some systemic disease, which escaped the diagnosticating powers of the observers, because the occurrence of a dread of drinking and a false preconception of its significance blinded their minds or set them irretrievably on a wrong scent.

It may seem singular that the symptoms of hydrophobia should

present the feature of intermittency. But a number of cases where this has occurred have been observed. Mr. Kenedy reported two such cases in 1680; Dr. Arnold reported one in 1793; and in 1803 Dr. Dumas reported to the Montpellier Med. Soc. what he called a "Case of a variety of Intermittent Fever accompanied by the Symptoms of Hydrophobia; and forming an Intermittent Hydrophobic Fever."

That the influence of the free use of mercury in former times may have had something to do with the production or prolongation of the symptoms of hydrophobia, seems a reasonable inference from the fact that this drug by itself is sufficient to set up an artificial disorder of this sort. Thus Dr. Reid,¹ in 1817, writing of tetanus and hydrophobia, speaks of a case of a young woman who died in the Westmoreland Lock-Hospital of hydrophobia, caused by mercury taken for syphilis. And lest this case should be cavilled at as one of ulcerative stomatitis, or other effect of salivation, I find that a record of an autopsy is accessible, which so far corresponds to many of more dubious cases that no lesion was found to account for the symptoms.

It is probably to the confusion created by the occurrence of hydrophobia as a symptom in a great variety of irregular disorders that we are to attribute the utterly erroneous teaching of Dr. Rush, that hydrophobia is a "malignant fever," and that, long before him, of Eustachius Rudius who called it "a putrida maligna humiditate caput petente morbum," with the following which this teaching has had. Are we not rather justified in recalling the old assertion of Mead, that hydrophobia may be a symptom of various fevers founded upon observations of Schenckius, Salmuth, and others, who had observed it in these disorders without any bite whatever? And is it not better to say with Band, in his inaugural Thesis on "Tetanos," Paris, 1804, quoting Vogel, "In acutâ et inflammatoriâ febre sponte oritur."

The natural condition in which hydrophobia may arise is *pregnancy*. Saint-Martin, in his *Monographie sur la Rage* (Paris, 1826), says that Mazars de Cazelles saw this to occur to one woman, during the first four months of her pregnancy, eleven times. Doléris speaks unequivocally of the occurrence of the symptoms of hydrophobia under these circumstances as a *signe dominante*, and other systematic writers do the same.

¹ On the Nature and Treatment of Tetanus and Hydrophobia, 8vo., pp. iv., 136. Dublin, 1817.

V. DISORDERS OF THE NERVOUS SYSTEM.

I now ask you to turn your attention to the disorders of the nervous system in which hydrophobia may be simulated. These may be classified roughly as those in which there is a well-defined pathology and those in which there is not. The former we will begin with, and pass on through the functional neuroses to the pure psychoses.

Meningitis, whether cerebral or spinal, may give rise to all the symptoms of excitement and dread of drinking which are commonly attributed to hydrophobia. This is a fact so well recognized that I will save your time by simply alluding to it and stating that a study of the appearances found at autopsies of persons dying of so-called hydrophobia, especially children, seems to indicate that acute or chronic inflammation of the meninges ought to be accused of not a few of these cases, and not the bite of a dog. In a case of supposed hydrophobia in a young child which I recently saw in consultation, I made the prediction that, if an autopsy was secured, we should find evidences of cerebral meningitis, both at the convexity and at the base of the brain. An autopsy was secured, and the prediction was fully verified—yet the gentleman who called me in consultation insists to this day that the case was one of hydrophobia.

Pachymeningitis is another disease of the envelopes of the brain which has been discovered after death attributed to hydrophobia. Such a case was mentioned by Dr. Mills in the discussion on this subject at the Philadelphia County Medical Society, last May (*Phila. Med. Times*, Aug. 11, 1883), and others are to be found scattered through its literature.

Apoplexy, one would think, could hardly put on the appearance of hydrophobia; but, in view of the singular forms it may assume and the variations from the typical picture which it may present, this possibility is not to be denied. Where apoplexy has the accompaniment of delirium, or mania, a very small diversion of the ideas of the patient or the physician might cause it to present all the phenomena of some cases I have met with, in which even the symptom of hemiplegia was not lacking. Dr. Prichard calls particular attention to the "affinity," as he calls it, between apoplexy and mania. This connection may not be so apparent to others as it was to him; but it is sufficient to put the student of hydrophobia on his guard against the possibility of an error of diagnosis dependent upon it. Bollinger says (*Virchow's Archiv*, iv., 1872): "When such diseases as acute and chronic hydrocephalus, meningitis, pyæmia, apoplexy, etc., are spoken of as accompaniments of

hydrophobia, the suspicion of diagnostic substitution lies near at hand."

This last quotation applies also to the next condition I wish to call your attention to, that is, *hydrocephalus*. There would not be much ground for believing, *a priori*, that acute or chronic hydrocephalus could simulate hydrophobia, but the fact that the *post-mortem* appearances of these conditions have been found in a certain number of persons dying of supposed hydrophobia, leads to the suspicion that the dread of water was really a symptom of the hydrocephalus. Here again is a point in regard to which the practitioner may well be more on his guard than some who have reported cases appear to have been.

Tumors in the substance of the brain, or pressing upon it, have very often been the occasion of the symptoms of hydrophobia. Of this I could give many illustrations, but will content myself with mentioning one form of tumor not common and very unapt to be suspected. I mean the cysticercus. One of the most impressive stories of a case of hydrophobia which I have ever read is that of a Dr. Herrmann, recorded by Lorinser in a paper entitled "Zwei Opfer der Hundswuth" (Two Sacrifices to Hydrophobia), published in the *Wiener Med. Wochenschrift*, in 1874. Dr. Herrmann had symptoms of hydrophobia, and died under the most painful circumstances. At the autopsy it was found that he had a cysticercus in his brain. A similar case has been put into English, in 1879, by Dolan. This case he got indirectly from an Italian journal. The patient was a woman; at the autopsy there was found at the base of her brain a cyst as large as a nut, full of cysticerci. Dr. Dolan, in reproducing this case, makes it a warning against errors of diagnosis of this sort.

Simple neuritis is set down by Doléris as one of the conditions in which hydrophobia may occur as a symptom. This he speaks of in connection with inflammation of the phrenic and pneumogastric nerves.¹ Nothing would seem more likely in view of the physiology and pathology of these nerves, and it suggests a line of investigation which has not had the attention it deserves.

We now come to the disorders of the cerebro-spinal system, which have a more obscure pathology. First of these we may take up *acute mania or delirium*. This is a division of our subject which might well have an entire paper devoted to it; but we must pass

¹ This opinion receives confirmation from an observation of Prof. Müller (cited by Bruckmüller, *Prager Vierteljahressch. f. d. prakt. Heilkunde*, 1852, II. Bd.), who found in two horses with rabies an inflammation of the neurilemma of the nerves at the spot of the bite, and the same condition in the nerves of a mad dog.

over it rapidly. And, first, I would refer to a celebrated case of Dr. Samuel Bardsley, of Manchester, which was said to be one of hydrophobia, with an incubation of twelve years. This case he made the subject of a long and elaborate paper on "Canine and Spontaneous Hydrophobia," published in 1807. The author's conclusion was that his was a case of spontaneous hydrophobia; but after studying it carefully, I do not see how there can be any doubt that it was a case of acute maniacal delirium, brought on by want and care and starvation. Bergéron (*Archives Gén. de Méd.*, 1862) calls attention to the identity of the symptoms of hydrophobia and acute mania; and Girard de Cailleux, Inspector-General of the Service of the Insane in Paris, has said: "The similarity of the symptoms, course, duration, termination, and cadaveric lesions of acquired hydrophobia and acute febrile delirium, establishes an identity of nature worthy of attention." (*Bul. de l'Acad. de Méd.*, T. xxix., 1067.) Bollinger has called attention to the fact that dogs dying with rabies present at their autopsies a condition called "Fremdkörperpneumonie" (foreign-body pneumonia), which is identical with a condition found in mental disorders of man. (*Virchow's Arch.*, Bd. LV., 1872.) Again, Westphal, at a meeting of the Berliner Med.-Psych. Gesellschaft, Jan. 1870, said he had seen a case which presented a typical picture of acute delirium, and added that physicians often misname psychic disturbances for hydrophobia; saying, also, that in depressed and hypochondriacal subjects the bite of a healthy dog may cause symptoms of hydrophobia. (*Arch. für Psych. und Nervenkrankheiten*, II. Bd., 1869-70, p. 520.) Again, at the discussion of hydrophobia in the Philadelphia County Medical Society, in 1883, Dr. Moon, whose experience in the treatment of the insane has been very great, said of a case recently reported by Dr. Wood in the same place, that he "might have been describing a typical case of acute mania as not infrequently seen." And, finally, Dr. Kiernan, of Chicago, says he has seen a case of acute mania which simulated hydrophobia so closely that a physician who had seen fifteen cases was only convinced that it was not "lyssa" when the patient recovered. (*Am. Journal of Neurology and Psychology*, May, 1883.)

Mania à potu, delirium tremens, or acute alcoholism, is probably one of the commonest occasions of error of diagnosis in regard to hydrophobia in adults. The symptoms of what may be called typical cases of these two disorders differ, it is true, in some particulars; but there are also enough points of resemblance to lead to mistake. Many authors have called attention to this fact, and it is being exemplified constantly all over the world. A case of this kind occurred in this city about two years ago. Doléris speaks of

the possibility that delirium tremens was the cause of death in the case reported, with reserve, by Dr. Léon Colin to the Acad. de Médecine, of Paris, in 1880, as having had an incubation of four and a half years, and says Brouardel has seen two cases in which the mistake would have been easy in the absence of other evidence. (*Nouv. Dict. de Méd. et de Chir.*, Art. "Rage humaine.")

A case of acute alcoholism simulating hydrophobia was published by Dr. W. B. Hazard in the *St. Louis Clinical Record*. The patient had pharyngeal and laryngeal spasms, and inability to drink fluids. He was at first rational, afterwards had mania, convulsions, and death. His previous history showed him to have been a hard and constant drinker. (*Brit. Med. Journ.*, Aug. 13, 1881, p. 256.)

A similar case was reported to the Académie de Médecine, of Paris, in 1882, by Dr. Denis-Dumont, as one of hydrophobia, cured by pilocarpine. But from the history of the case and from a letter published subsequently by M. Victor Chatel, there can be no doubt that the patient was a victim to drink and not to the virus of rabies. (*Bul. de l'Acad. de Méd.* for 1882, pp. 730, 760.)

If, in spite of the fact that mistakes of diagnosis of this sort have been made by men of reputation, it should be said—as it has been—that the diagnosis of delirium tremens can be established by the evidence of alcoholic excess if inquiry on this score be not neglected, I would call your attention to the fact, that alcoholism is not the only cause of delirium tremens. Dr. Handfield Jones, in his *Studies on Functional Nervous Disorders*, points this out, and cites cases in which this form of delirium was caused by mental strain, and one case in which it was caused by the horror of a sailor at the murder of two of his companions. Such a delirium, following the bite of a dog suspected to be mad, might easily come to be considered a typical hydrophobia.

We now come to the consideration of *tetanus*, the analogy between which and hydrophobia is so great as to have impressed not only the older medical writers, but also the most recent; and no one, I think, who has witnessed both disorders can fail to have been struck with it. There is, in fact—admitting, for the sake of the argument, all that is claimed by the believers in the specific nature of each—a hydrophobic tetanus and a tetanic hydrophobia. Their variations are so frequent as to have led to many errors, and their similarity is so great as to have led to the repeated assertion that they are identical. Dr. Samuel Bardsley refers to the coincident opinions of Dr. Rush and Dr. Percival as to the similarity of these two disorders, and gives a case where the symptoms of hydrophobia were caused by a splinter in the finger. Commenting on this, he

says: "It is also sufficiently evident that the action of the canine poison produces similar effects. But its superior mischievous activity, in comparison with any other occasional cause, cannot be denied. Yet I apprehend we ought to attribute the more fatal virulence of the canine poison rather to the difference in degree than in the nature of the cause; for, undoubtedly, the identity of effect warrants the conclusion of an identity of the cause."

This is putting the matter rather boldly for one who believed thoroughly in the specific nature of hydrophobia. But a very large number of cases could be cited to show that at least tetanus may so resemble hydrophobia as to deceive tolerably careful observers. Quite recently Dr. Hamilton, of this city, reported, as a warning against error, a case where an inflamed contused wound was followed by tetanoid symptoms, to which "hydrophobic symptoms supervened, shuddering and going into spasms whenever an effort was made to drink water. This condition continued about thirty hours, when death ensued. The patient had never been bitten by a dog." (*Phila. Med. Times*, Aug. 11, 1883.) At the same time Dr. Mills spoke of an analogous case in which an injury to the finger with a brick was followed by tetanoid and hydrophobic symptoms, "with well-marked sputtering of saliva, which is considered so typical a symptom of hydrophobia." (*Loc. cit.*)

In the article on Tetanus, in the *Nouv. Dict. de Méd. et de Chir.*, Paris, 1883, Dr. Poncet remarks: "Facts of this sort are so much more numerous nowadays in the medical publications, that they attract attention, suggesting the thought of hydrophobia. Kirckhoff has reported an observation of hydrophobic tetanus following the lodgment of a splinter in the hairy scalp. Trismus and intense dysphagia accompanied the opisthotonos; the sight of water redoubled the spasms (*contractures*)."

I will not detain you with other illustrations of the simulation of hydrophobia by tetanus. But I will call your attention to the fact that this simulation may probably explain not only many cases of supposed long incubation, but also many of the cases attributed to the bites of non-rabid dogs, and the bites of human beings. There have been so many cases of typical hydrophobia for which no bite could be discovered that they have led even so famous a veterinarian as Fleming, after long denying it, to admit that hydrophobia may be caused by the bite of a non-rabid animal. (*Lancet*, March 24, 1876.) It is a remarkable fact that the defenders of the specific theory of hydrophobia fail to see the full significance of such admissions as this. For if—as is undeniable—the bite of a dog not mad may, and often does, cause hydrophobia, where is the force of the assumption of a peculiar virus in the saliva of a mad dog,

when the truth of this assumption can only be established by peculiar effects? If, in other words, the bite of a healthy dog may cause a certain series of phenomena, where is the ground for attributing such phenomena to anything specific in the saliva of a special morbid state?

The pertinence of this query is strengthened by a consideration of the fact that hydrophobia (probably of the tetanoid kind) has been caused many times by the bite of human beings, sick and well. One of the most curious instances of this sort was the case communicated by Schenckius to Malpighi (*Opera Posthuma*, Venetiis, 1698, p. 55), of a woman who is said to have died of hydrophobia caused by the bite of her epileptic daughter. The absolutely most curious, I think, is furnished in a story told by Scaramucci (whose name is commonly misspelled Scaramuchi or Scaramuzzi), where a young man died of hydrophobia after having bitten himself in the finger, when in a rage because his mistress had proved faithless. In this century Vernois cited before the French *Académie de Médecine*, in 1863, a case where a man had the symptoms of hydrophobia after the bite of one with trismus. Dr. Wright, in his learned but little known articles on "The Physiology and Pathology of the Saliva" (*Lancet*, 1842-44), speaks of ten cases where hydrophobia followed the bite of angry human beings, and I have read the histories of I cannot tell how many similar cases. Finally, before leaving the cases of hydrophobia caused by traumatism, I will merely mention a case which Saint-Martin (*Monographie sur la Rage*, Paris, 1826) cites from Girard, in which a man had hydrophobia after a violent fist fight.

Epilepsy is the next disorder in which hydrophobia is simulated, to which I call your attention. To many medical men it might seem strange that it should be possible to confound these two disorders. To them epilepsy seems to be a simple enough disease to diagnose. In general this is the case, but occasionally the matter is far from simple. For epilepsy may assume Protean forms, and vary so much from the conventional type that only prolonged observation could make an absolute diagnosis possible, while the death, in an attack, of an individual not previously under notice, may make a correct diagnosis almost impossible. To illustrate this, let me ask you to keep in your mind the phenomena of many cases of hydrophobia while I quote some expressions from the lecture of Dr. Todd to which I have already referred. He says, speaking of epileptic delirium:—

"The delirium, in cases of this description, is in general of the most decided kind, and it often amounts to mania. The patient is wakeful, noisy, sometimes mischievous, sometimes muttering and

incoherent, and unintelligible, sometimes distinct and easily understood, *the subject of his ravings being determined by circumstances or events which had previously more or less occupied his mind.*

. . . The effects of any long continuance of this delirium are to induce exhaustion, as, indeed, is the case with all forms of delirium, and patients sometimes die suddenly, even when they may seem to be on the road to recovery." He speaks also of death occurring from exhaustion, even in cases where there is no violence nor any convulsion.

Is it not easy to see how such an attack, in a person who had been bitten by a suspected dog, would translate itself, in his own mind, in that of his friends, and even in that of his medical attendant, into one of hydrophobia, upon the first suggestion of this idea?

It is very well known that fright has a great influence in the production of epilepsy, and it is easy to understand that an epilepsy might be caused by the bite of a dog, received under circumstances calculated to cause alarm, or followed by occasions of such a state of mind, which would simulate hydrophobia very closely, and even end in death. Nor are specific examples of the simulation of hydrophobia by epilepsy wanting to justify this supposition. I will refer to only two, the latest recorded, so far as I know. These two cases were published by Dr. Kiernan, in the *Am. Journal of Neurology and Psychology*, May, 1882. In the second of them the picture of hydrophobia was typical, there being dilatation of the pupils, spitting of thick saliva, and constriction of the throat, with laryngeal spasm when water was allowed to run from a faucet in the hearing of the patient.

Apropos of this it is curious to note that Burton, in his *Anatomy of Melancholy*, Part I., Sec. 1, Mem. 1, Subs. 4, declares, on the authority of Heurnius, those with hydrophobia "to lye awake, to be pensive, sad, to see strange visions, to bark and howl, to fall into a swoon, and oftentimes fits of the falling sickness."

We come now to the psychoses in which the symptoms of hydrophobia may appear. To treat of these fully would require so much more time than we have to give to them, that it is fortunate that the necessity for fulness is not pressing. For the importance of this factor in the popular idea of hydrophobia is generally—if somewhat vaguely—recognized. Here, as in the simulation of other disorders, the first thought of all is apt to turn to *hysteria*. This strange mimic of almost everything has played no unimportant rôle in the history of hydrophobia. Its influence may be suspected in some of the conditions which we have already discussed, and to it alone may be credited a great many cases of so-called hydrophobia to be found

scattered through the monographs and treatises on this subject. There are so many of these that I will not mention one, unless, as has been intimated, the influence of hysteria can be detected in cases already mentioned or in those to be next cited.

This class of disorders is that in which the symptoms of hydrophobia have been produced by various *psychical impressions*. Of this class innumerable illustrations might be given, but we have time for only a few. The most ancient instance of this sort is that of Themison, a Greek physician of the first century before Christ, to whom Juvenal, in his tenth satire, applied a pleasantry, the like of which is still occasionally heard: "*Quot Themison aegros autumnno occiderit uno.*" Themison attended with great devotion a friend who died of hydrophobia, and he afterward had attacks like it whenever he recalled the horrors he had witnessed. It is also said that he thrice attempted to write a treatise on hydrophobia, and each time was forced to desist, because he found himself falling into a state similar to that which he was describing. In modern times there was a curious instance narrated by Busnoût (*Thèse de Paris*, 1814, No. 17), and since repeated by Saint-Martin—from whom I take it—and by Chomel, Tuke, and others, where a woman had hydrophobia after receiving the news of her husband's death, and actually communicated it—so the story goes—to her pet dog, which licked her lips during her illness. Then there is the old story of the two brothers of Montpellier, which I have traced back through various authors to Sauvages¹ (*Dissertation sur la Rage—Œuvres Diverses*, Paris, 771, p. 11), who got it from Chirac. Here, both were bitten the same day by a dog; one went to Holland, the other stayed behind and died of hydrophobia in forty days. The first heard nothing of this till his return home at the end of ten years, when he was informed of the manner of his brother's death, whereupon he too had the hydrophobia and died. Saint-Martin cites from Puteau (*Essai sur la Rage*) the case of a young man who had hydrophobia after falling into a violent fit of passion. He also gives a similar case in which the symptoms were typical, where a man who was rheumatic feared a beating from his brother, and after an altercation with the latter's wife fell into a state of lassitude which developed into hydrophobia.

¹ This story is so often referred to in a way which shows that it has not been got from the original source that I think it may be worth while to reproduce it exactly. Sauvages says: "M. Chirac vit un jeune Marchand de Montpellier, qui n'enragea que dix ans après, quand revenant de Hollande, où il avait été, après avoir été mordu à même temps que son frère le cadet, il apprit la mort tragique de celui-ci, arrivée quarante jours après leurs morsure."

The same author—who I ought perhaps to say was no denier of the specific theory of hydrophobia—gives a frequently quoted case from Pinel, where a young soldier had hydrophobia after being alarmed at midnight by his comrades who had suspected and accused him of cowardice. Bardsley (*Medical Reports*, London, 1807) cites a case from Platerus where a woman had hydrophobia and died after an alarm consequent upon being left alone on the bank of a river when darkness came on. He cites another case from Sauvages (*Nosologia Methodica*) where the most unmistakable hydrophobia was caused in a young woman by attempts upon her virtue during her menstruation. The mere sight of liquids threw her into frightful convulsions, and she died in three days. Magendie published in 1823 (*Journal de Physiologie*, tome iii.) a report of a case caused by a love affair, where he showed his faith in the genuineness of the hydrophobia by putting the patient into a strait-jacket, bleeding him well several times, and injecting two pints of warm water into his veins; after which the poor fellow died, having heard, as Magendie naïvely reports, only a short time before he died that he had hydrophobia, and had been experimented on. Dr. Norris (*Lancet*, Sept. 22, 1871) tells of a man whose son had been bitten by a dog, and who himself was so horrified that he fell into an acute mania after forty-eight days, and died in a condition which would surely have been called hydrophobia, if he had had the bite instead of his son. Dr. Massmann (*Deutsche med. Wochenschrift*, June 28, July 5, 1879) reports a case as one of genuine hydrophobia, in which a man seemed to be recovering under the use of chloral, but after an interval of three weeks another attack was brought on by an accusation of malingering from his companions, and he died in twenty hours. A most interesting case is recorded by Dr. Fayrer in a letter to the *Lancet*, Nov. 24, 1877, of a young man bitten by a dog, not even suspected of being mad, who read a story in Blackwood's Magazine, entitled "The Longest Month in my Life," which described the experiences of a man in the incubation period of hydrophobia. After reading this the young man killed the dog that had bitten him, and at the end of the time given in the story as the period of incubation he, too, had symptoms of hydrophobia, and died in a few days. There is a striking story cited from Stadthagen by Bollinger in his article on Hydrophobia in *Ziemssen's Cyclopædia*. The subject was a boy, who was followed about by a street rabble, who charged him with having hydrophobia. In consequence, he became so frightened that he began to manifest the symptoms of hydrophobia. Having been sent home to his parents in the country, he speedily recovered. On his return to the city, however, the

same cruel charge was made against him, and he relapsed into his former apparently hydrophobic state.

There is one other condition in which the symptoms of hydrophobia are to be observed, without the mention of which this paper would be very incomplete. This condition is the *delirium caused by opium, belladonna, and other narcotic poisons*. I am satisfied, from my investigations, that the use of any of these drugs in the treatment of so-called hydrophobia is either useless or highly dangerous. I have little doubt that many deaths have been caused by the combination of intense psychical excitement on the part of the patient, restraint, and the administration of narcotics. There seems to be, in fact, a state of psychical excitement, in which to use narcotics is like dashing water upon a raging furnace, which does not put it out, but causes an explosion. And I would remark, parenthetically, that I believe it is very questionable whether morphia should ever be used in the treatment of hydrophobia, no matter what view may be held as to its nature.

Finally, I will suggest for reflection the idea which lies hidden in the following story, which I purposely select from a physician who lived and died three centuries ago: A healthy and robust countryman being suddenly attacked with sweating and a constriction about the heart, accompanied with a sense of anxiety, Marcellus Donatus was sent for to attend him. The instant he saw the sick man he predicted that he would neither swallow liquids nor live many hours. This prediction was duly fulfilled, for when cold water was offered to the patient he was seized with horror, and died in a few hours.

In concluding this paper I must express my regret that the limit of our time has made it impossible to present a tithe of the evidence I have collected in regard to the disorders mistaken for hydrophobia. But I trust that what has been presented may serve to indicate a way in which this very important phase of the hydrophobia question may be profitably studied. To do this thoroughly the lines here entered upon must be followed up. The diseases in which the symptoms of hydrophobia have been observed must be made much more familiar to the great body of medical men than they have ever been before. Especially, I think, must the class of neuroses and psychoses be better understood and more fully appreciated. With a full knowledge of all these, the physician would be well armed against error; with much less he may be at least fairly warned. With no knowledge of this kind, or ruled by a spirit which underrates its importance and significance, his observations are likely only to fix more firmly the roots of errors planted in the

darkest ages of medical ignorance—roots which cling to the soil in which they have so long grown, and cry out mightily when they are laid hold upon, but which we may hope will some day be eradicated forever, to the good of humanity and the glory of our profession.

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¹ All the works here named I have personally examined, and I have indicated by black-faced type those I think of special value. To this it may be added that all the discussions at the French Academy of Medicine are worthy of careful study. The oldest works are classed with those of special value, sometimes for their "historical interest."

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